RHIC QLI – Power Supply / Diagnostic Reports for (p^ Run 2001 - 2002)
December 31, 2001 thru January-06, 2002

Monday: Dec 31, 2001

Monday, Dec 31, 2001: Beam Abort, 2b-ps1 QLI in Blue ring, 2b-ps1 (Summary Time: 00:04:40 +350577)
QPA Faults: Blue power supplies off, QP11-R2BD2-b2-dhx-qp (Crowbar), Yellow supplies and Tq's remain on.
QD Alarms: None indicated they fired, still in the Running mode.
DX Heaters: None fired, 4b and 10a "Set State" with no indication.
QdRealQuench: No detectors tripped, all in the Running mode.
Postmortems: Appears b2-dho current begins to take off -2.2sec before T=0, then the b2-dho responds as current goes to +80amps at -0.02sec causing voltage to spike to maximum causing a Crowbar Fault.
Qdplots: BDMC=473.44amps, sitting at injection begins to ramp up -3.266seconds before T=0.
Beam Loss Monitors: N/A
Quench Status: Not real
Reason: b2-dhx-qp Crowbar Fault.

Permit.3c-ps1 Snake Link Failure (Time: 02:21:20 +3412065)

Monday, Dec 31, 2001:
Yellow Snake - Alcove 3C, yi3-snk7-2.3-p.s. (Snapshot Data Time: 02:21:23)
Snap Shot: Current began to drop then p.s. tripped off
Current Settings: YMDC = 473.45amps. Snake Magnet Current = 325.58amps.
Qdplots V-tap: SNK7_VT goes negative approx. -0.149sec.
Beam Loss Monitors: No data available.
Quench Status: REAL MAGNET QUENCH.
Reason: Beam induced while tuning yellow vertical injection.

Yellow Snake - Alcove 3C, yi3-snk7-1.4-p.s. (Snapshot Data Time: 02:21:26)
Snap Shot: Iref drops before Current
Current Settings: yi3-snk7-1.4-p.s.= 99.64amps.
Qdplots V-tap: Indicate that perturbation took place for both V-taps around -2.603sec before T=0.
Quench Status: REAL MAGNET QUENCH.
Reason: Quenched due to the yi3-snk7-2.3 magnet quench.

From the Physics Logs: 02:24:11 comment by...gjm -- hit the snake while tuning yellow vertical injection...

Tuesday, January 01, 2002: HAPPY NEW YEAR!

Permit.9c-ps1, Snake Link Failure (Time: 03:52:36 +1509612)

Tuesday, January 01, 2002:
Blue Snake - Alcove 9C, bi9-snk7-2.3-ps (Snapshot Data Time: 03:52:37)
Snap Shot: (Stby-error), current drops before Iref, voltage goes up, current down.
Current Settings: BMDC = 473.44 sitting at Injection. Snake Magnet Current = 326.45amps.
Qdplots V-tap: BI9SNK7_2VT goes negative approximately -0.22sec before T=0.
Beam Loss Monitors: No data available.
Quench Status: REAL MAGNET QUENCH.
Reason: Beam induced.

Blue Snake - Alcove 9C, bi9-snk7-1.4-ps (Snapshot Data Time: 03:52:39)
Snap Shot: (Stby-error), current drops before Iref.
Current Settings: Snake Magnet Current = 100.24amps.
Qdplots V-tap: Indicates that perturbation occurred approximately -1.957sec before T=0.
Quench Status: REAL MAGNET QUENCH.
Reason: Caused by the SNK7-2.3 magnet quenching.

From the Physics Logs: 03:55:40- hit the snake with the second shot of beam in Blue... time for a 1.5 hour nap.gjm Waiting for ring temperatures to recover.

Permit.9c-ps1, Snake Link Failure (Time: 06:13:00 +3366684)

Tuesday, January 01, 2002:

Blue Snake - Alcove 9C, bi9-snk7-2.3-ps (Snapshot Data Time: 06:13:00)
Snap Shot: (Stby-error), current drops before Iref, voltage goes up, current down.
Current Settings: BMDC = 473.44 sitting at Injection. Snake Magnet Current = 326.48amps.
Qdplots V-tap: BI9SNK7_2VT goes negative approximately -0.249ec before T=0.
Beam Loss Monitors: No data available.
Quench Status: REAL MAGNET QUENCH.
Reason: Beam induced.

Blue Snake - Alcove 9C, bi9-snk7-1.4-ps (Snapshot Data Time: 06:13:00)
Snap Shot: (Stby-error), current drops before Iref.
Current Settings: Snake Magnet Current = 100.27amps.
Qdplots V-tap: Indicates that perturbation occurred approximately -2.01sec before T=0.
Quench Status: REAL MAGNET QUENCH.
Reason: Caused by the SNK7-2.3 magnet quenching.

From the Physics Logs: 0613: Another Blue snake quench occurred after a handful of shots in Blue, even with reduced Linac beam intensity.

08:13:59- Snake quenches at injection in blue continue. We will try to fill with the snakes off to correct the blue orbit. Peggy 09:58:28 comment by...TJS -- From Greg's comment on the overnight shift, another question: is the blue injection kicker setup happy? (Check timing, for instance...) With vertical offsets in the snakes that are large at injection, bad vertical injection conditions can certainly be a root cause for snake quenches.

Quench Link Interlock in both Blue and Yellow rings; Blue permit.7b-ps1 was pulled; End of Store

Tuesday, January 01, 2002: Beam Abort, 7b-ps1 QLI in Blue ring, 7b-ps1, (Summary Time: 19:49:48 +506379)
QPA Faults: N/A
QD Alarms: All tripped indicating positive Tq values.
DX Heaters: did not fire, 4b and 10a "Set State" have no ON status.
QdRealQuench: 18 detectors tripped with no indications, 2 remain in the RUN mode.
Postmortems: Blue dipole and quad mains look normal.
Qdplots: BQMC = 1842.45, BDMC = 1952.23 sitting at top energy.
Beam Loss Monitors: Sector 7 has low rates.
Quench Status: Not real
Reason: **Unexplained 7b-ps1**, possible coincidence with the Phobos magnet ramping but will have to wait to see if this occurs again in the future.

Tuesday, January 01, 2002: Beam Abort, 7b-ps1 QLI in Yellow ring, 7b-ps1, (Summary Time: 19:49:48 +506380)
QPA Faults: N/A
QD Alarms: 7 quench detectors fired with positive Tq values, 5 never finished dumping data.
DX Heaters: did not fire, 4b and 10a "Set State" have no ON status.
QdRealQuench: 18 detectors tripped with no indications, 2 remain in the RUN mode.
Postmortems: Yellow dipole and quad mains look normal.
Qdplots: YDMC = 1952.36amps, YQMC = 1840.56amps.
Beam Loss Monitors: Sector 7 has low rates.
Quench Status: Not real
Reason: (**Unexplained 7b-ps1**, same as QLI above).

From the Physics Logs: 19:59:06- Phobos reports they were ramping their magnet about 30 seconds prior to the quench link interlock.

Tuesday, January 01, 2002: QLI in Blue ring, 2b-ps1, (Actual Time: 20:27:20 +3023851)
QPA Faults: All off except for Yellow Tq's which remain ON.
QD Alarms: Only (2b-qd1) indicates an item, B2DRDO_DO, Tq +1466, all others in RUN mode.
DX Heaters: did not fire, 4b and 10a "Set State" have no ON status.
QdRealQuench: (4b-qd1) B3QFQ2_VT
Postmortems: Power supplies at low end currents, not the same signature as the dh0 causing the dhx to trip on crowbar like on Dec 30th and Dec 31.
Qdplots: BDMC = 49.99 sitting at Park, YDMC = zero. B2QLO1 drops approx. -2.05sec before T=0.
Beam Loss Monitors: N/A
Quench Status: Not real.
Reason: It appears during the Quench Recovery Program, MCR used the Diagnostic Mode, which turned the power supplies from On to Standby to Off. Under normal conditions, the recovery program does not turn the supplies to "OFF".

From the Physics Logs: -- 21:08:31 comment by...BvK -- Plot of the beam was lost due to a Quench Link Interlock verse Phobos magnet coming up to full current. 2055: Cryo Control Room reports that they saw no problems during the Quench link interlock in Blue and Yellow

Wednesday, January 02, 2002:

(Record Store for RHIC Machine): Wednesday-Thursday 2-3 January 2002, 2300-0700 EST GJM Last shift's store continued through most of the shift (15 hours total for this store) until Beam Studies began after 0600

16:26:22 comment by...vp -- **b2-q6** oscillates on the ramp producing tune oscillations on the ramp shown two plots above.

Thursday, January 03, 2002:

Beam Studies:
12:40:41- End of 110 bunches - both beams dumped.
13:00:25- THIS IS THE END Fulvia

Maintenance from 1300 hrs to 1600 hrs.

Both Rings shut down for Reload of software for Quench Detector Systems.
Time: (13:33:56 +3701475)- Quench Link Interlock in Blue ring, 4b-time.A dropped first
Time: (13:36:04 +2955232)- Quench Link Interlock in Yellow ring, 4b-time.A dropped first
Time: (Snapshot: 13:34:42)- Snake Quench yo9-snk7-2.3-ps Wrong Ramp Factor while ramping down.

Power Supply Work Performed:

6000 amp Quench Switch: opened for inspection for a future modification during shut down.
Correctors: **yi2-qs3-ps** power supply was pulling down the setpoint, also the Low Res. Card was replaced because of possible failure.
yo5-qs3-ps was replaced due to tripping to the OFF state on it's own.
Dynapower P.S. **b2-q6-ps** changed the fiber optics card due to problems during ramp up. Signal looked like pulses (staircase effect) Phil Pape found the DAC was not properly seated in the socket, this could have been the cause.
b2-dh0-ps and **b8-dh0-ps** current regulator cards were replaced due to possible cause as to their respective dhx power supplies tripping off on crowbar when turned on. (Possible problem may still be within the Firing Circuit Cards and they may have to be modified with the interlock circuit if the problem re-occurs).
Hysterisis Ramp: Performed to check b2-q6-ps and it looks good.

Friday, January 04, 2002:

0117: Beam is stored and cogged; Experimenters are bring up their main magnets; Physics Running
No other problems.

Saturday, January 05, 2002:

From the Physics Logs:
16:25:33- Shortly after re-bucketing, Dejan started trying to compensate for **yo8-th12. It tripped during the ramp**, but was not immediately affecting the lifetime. In retrospect, the re-bucketing probably was the real impetus for the loss we were hoping to correct. The corrector was compensated for only on the flattop stone, but the difference orbit there was very slight. ***(Will be looked at during next maintenance period)***

Sunday, January 06, 2002:

0748: BLIP off for RHIC injection.
07:58:48- Beam Abort, 2b-ps1 dropped Yellow Quench Sequencer

Sunday, January 06, 2002: QLI in Yellow ring, 2b-ps1, (Actual Time: 07:58:40 +3629831)
QPA Faults: QP05-R2BQD3-yi2-qf9-qp (FAN FAULT), all other yellow off, blue and all tq's remain "ON".
QD Alarms: All tripped with positive Tq values.
DX Heaters: None fired.
QdRealQuench: 12 detectors tripped with no indications.
Postmortems: Found nothing unusual, yi2-qf9 Iref dropped +0.011sec after T=0.
Qdplots: YDMC = 473.45amps, YQMC = 449.56amps, sitting at Injection.
Beam Loss Monitors: N/A
Quench Status: Not real.
Reason: Fan fault, possible switch contacts on the air vane switch for yi2-qf9-qp.

From the Physics Logs: Yellow Quench Link interlock starting from 2b-ps1 while tuning injection with one bunch in the Yellow Ring.

Other Notes From the Physics Logs:
09:05:53- We attempted to inject before running a hysteresis ramp. After adjusting the muX in Blue and both tunes in Yellow, we gave up since the Yellow beam intensity was still lower than Blue (0.7 TP max compared to 1 TP). We'll see what things look like after the hysteresis ramp.

10:43:59- **yo8-th12** (switched off yesterday) has been compensated over the whole ramp. vp ***(Will be looked at during next maintenance period)***

12:38:59 comment by...TJS -- **yi3-octd** didn't ramp this time around again. Perhaps this and the high intensity contributed to the instability loss? 12:45:07 comment by...TJS -- Oops. Never mind; this octupole hasn't been ramping for a long time, at least since its last mention in the log, which was Dec 23. ***(Will be looked at during next maintenance period)***